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NEW XANTHOPARMELIAE (LICHENES) FROM SOUTHERN AND CENTRAL AFRICA

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Abstract

Ten new species of *Xanthoparmelia* are described from southern and central Africa, and one new combination in the genus is proposed. The new species are *X. aggregata* Knox, *X. cedrus-montana* Brusse, *X. dysprosa* Brusse et Knox, *X. ianthina* Brusse, *X. karoo* Knox et Brusse and *X. leucostigma* Brusse from the Karoo and Western Cape, *X. cylindriloba* Knox and *X. hedbergii* Knox from Kenya, *X. fucina* Knox from Zimbabwe and *X. walteri* Knox from South West Africa/Namibia. The new combination is *X. exornata* (Zahlbr.) Brusse et Knox from the Karoo.

Uittreksel

NUWE XANTHOPARMELIAE (LICHENES) VAN SUIDELIKE EN SENTRAAL AFRIKA

Tien nuwe soorte van *Xanthoparmelia* van suidelike en sentraal Afrika word beskryf, en een nuwe kombinasie in die genus word voorgestel. Die nuwe soorte is *X. aggregata* Knox, *X. cedrus-montana* Brusse, *X. dysprosa* Brusse et Knox, *X. ianthina* Brusse, *X. karoo* Knox et Brusse en *X. leucostigma* Brusse van die Karoo en Westelike Kaap, *X. cylindriloba* Knox en *X. hedbergii* Knox van Kenia, *X. fucina* Knox van Zimbabwe en *X. walteri* Knox van Suidwes Afrika/Namibia. Die nuwe kombinasie is *X. exornata* (Zahlbr). Brusse et Knox van die Karoo.

Introduction

Lichens now placed in the genus *Xanthoparmelia* were first recognised as a distinct group by Nylander (1860), who placed them in his "Stirps Parmeliae conspersae". The distinction was further consolidated by Wainio (1890), who coined the name *Xanthoparmelia* for this section of the subgenus *Euparmelia* Nyl., placing in the section all narrow-lobed yellow-green species (containing the pigment usnic acid in the upper cortex). In elevating the group to subgeneric status Hale, in Hale and Kurokawa (1964), employed substrate ecology, rhizine morphology and the absence of cilia to refine Wainio's (1890) concept, and this interpretation was retained when Hale (1974)

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raised the group to generic status. This final step has been rejected by Beltman (1978), Krog and Swinscow (1979), Hawksworth *et al.* (1980), Elix (1981) and Poelt and Vĕzda (1981), although Krog and Swinscow (1979) and Elix (1981) accept the subgeneric ranking. Elix (1981) pointed out that in the genera *Xanthoparmelia, Pseudoparmelia* and *Neofuscelia,* all genera which have been segregated from *Parmelia* sensu lato, striking morphological parallels may be found, the generic segregation in such cases being effectively based solely on the chemical constituents present in the upper cortex. This may be argued to be inadequate grounds, and certainly suggests that additional criteria must be sought and considered in an attempt to resolve this problem.

In the present paper, no attempt is made further to consider this question, but *Xanthoparmelia* is recognised at generic level because of the distinctive morphology of the majority of species, because of its ability to survive and grow in arid conditions, and because of its characteristic tendency, by comparison with the other two genera mentioned above, to produce luxuriant growth in moister environments.

The following species have been described from specimens collected from the Karoo and adjacent regions by one author (F.A.B.) during the course of a taxonomic investigation into the genus presented for the degree of M.Sc. at the University of the Witwatersrand, and from specimens seen by the other author at the Smithsonian Institution, Washington, D.C., while on extended study leave from the same University.

Xanthoparmelia aggregata Knox, sp. nov. **Fig. 1.**

Thallus sordide flavescenti-virescens, stellatus, usque ad 50 mm diametro, terricola, laxe affixus. Lobi 0,5–1,5 mm lati, ligulati vel canaliculati, ramosi, abrupte decrescentibus apicem versus. Pagina infera concolora vel quam pagina superior parum fuscans, maculae aliquot atrantes, cum rhizinis plerumque consociatae, exclusae. Isidiis sorediisque carens. Cortex superior 40–50 μm crassus, stratum gonidiale 60–65 μm crassum, sed stratum gonidiale 18–20 μm crassum cum pagina infera concolora consociatum, medulla alba 220–240 μm crassa, cortex inferior 18–20 μm crassus. Apothecia pycnidiaque ignota, sed perithecia parasitica adsunt.

Cortex superior K non reagens (acidum usnicum continens), medulla alba K straminea; C, KC pallide rosea, P non reagens (acidum evernicum continens).

Typus: CAPE—3118 (Vanrhynsdorp): Salt River (-BC), van Rhyn's Dorp Division (Cape Province), on ground, Sept., 1941, *Stokoe 7721* (BOL, holotype; US, isotype).

OTHER SPECIMEN SEEN

N. S. Pillans s.n., January 1928 (BOL).

Xanthoparmelia aggregata is a member of the *X. amphixantha* (Müll. Arg.) Hale morphological group, based on an Australian species, *X. amphixantha,* containing stictic, norstictic and constictic acids, and including *Parmelia (Xanthoparmelia) pseudoamphixantha* Elix (norstictic and connorstictic acids), *P. (X.) reptans* Kurok. (fumarprotocetraric and succinprotocetraric acids) and *P. (X.) willisii* Kurok. (fumarprotocetraric, succinprotocetraric and protocetraric acids). From South Africa *X. subflabellata* (Steiner) Hale contains stictic, norstictic and constictic acids, and may well be synonymous with *X. amphixantha.*

All the above lichen acids are ß-orcinol depsidones, which is the most common group of such substances in the genus *Xanthoparmelia. Xanthoparmelia aggregata,* however, contains evernic acid, an orcinol p-depside, which although not closely related to the ß-orcinol depsidones, is clearly simpler in structure, and could therefore be considered to be more primitive. Other orcinol p-depsides found in *Xanthoparmelia* species are lecanoric acid, found in *X. worcesteri* (Steiner et Zahlbr.) Hale, *X. joranadia* (Nash) Hale, *X. arida* Egan et Derstine and *X. lecanorica* (Hale) Hale, and gyrophoric acid, found in *X. leucostigma* Brusse, described later in this paper. Evernic acid is found also in *X. dysprosa* Brusse et Knox, another new species described herein. This small proportion, 8 out of approximately 170 species, emphasises the relative rarity of these substances in *Xanthoparmelia*, but the scattered distribution—*X. joranadia* and *X. arida* in North America and the remainder in South Africa—together with the considerable diversity of thallus morphology in these species, does not permit any simple explanation of their occurrence. It appears that orcinol p-depsides must have arisen independently on a number of occasions.

Xanthoparmelia cedrus-montana Brusse, sp. nov. **Fig. 2.**

Thallus foliosus, nitidus vel sordide flavovirens, laxe vel moderate adnatus, saxicola, usque ad 100 mm diametro. Lobi sublineares vel elongati, imbracati, 0,3–2,0 mm lati, leviter vel valde albomaculati. Pagina infera nigra, rhizinis absentibus vel moderate abundantibus. Isidiis sorediisque carens. Cortex superior 25–50 µm crassus, stratum gonidiale discontinuum, 0–50 µm crassum, medulla alba 100–200 µm crassa, cortex inferior 15–20 µm crassus. Apothecia cupulis vadosis, substipitata, usque ad 6 mm diametro, rara. Hymenium 40–60 µm crassum, subhymenium 10–20 µm crassum, excipulum 30–60 µm crassum. Sporae 8, 8,0–12,0 × 4,5–7,0 µm. Pycnidia 100–150 µm diametro, pycnidiosporae non visae.

Cortex superior K non reagens (acidum usnicum continens), medulla alba K aurea sed armeniacescens, C non reagens, P aurantiaca (acidum thamnolicum continens).

Typus: CAPE—3319 (Worcester): Ceres (-AD), June 1924, *T. B. Leslie 476* (TUR–V 34575).

OTHER SPECIMEN SEEN

Brusse 772–8–2–19, 8/2/77 (J).

The holotype specimen is annotated, apparently by Leslie, as "var. *hypomelaena* Vainio", referring to *Parmelia stenophylla* f. *hypomelaena* Vainio ex Lynge (1937), as annotated by Hale. The epithet *hypomelaena* is, however, unavailable in *Xanthoparmelia* at the specific level, having been used by Hale (1974).

This further addition to the *X. hypoleia* (Nyl.) Hale complex appears to be restricted in distribution to the Cedarberg Range in the Western Cape. A further survey carried out in 1981 produced no additional material.

The *X. hypoleia* complex includes at present specimens known to contain at least 11 different medullary substances, distributed between 9 species, including the three in the present paper. Relationships between these have been discussed (Knox, 1981), and will be the subject of a later publication.

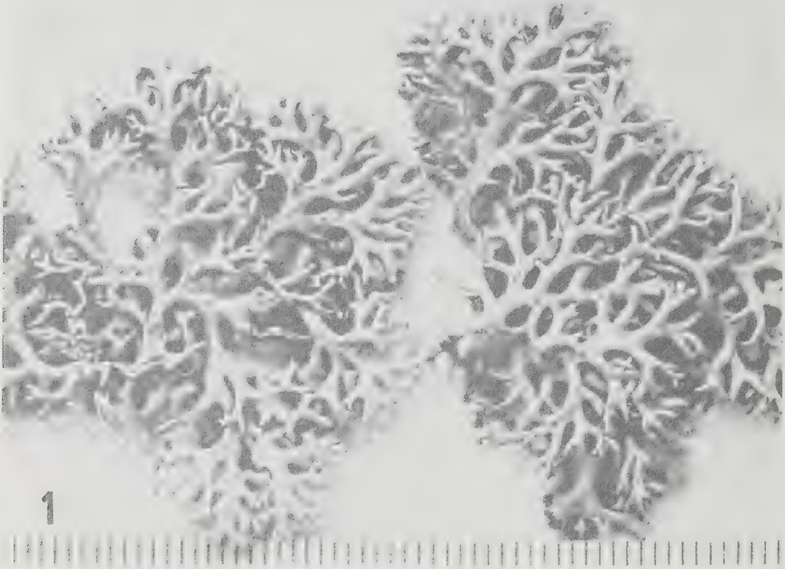

FIG. 1.
Xanthoparmelia aggregata Knox (holotype). Scale in mm.

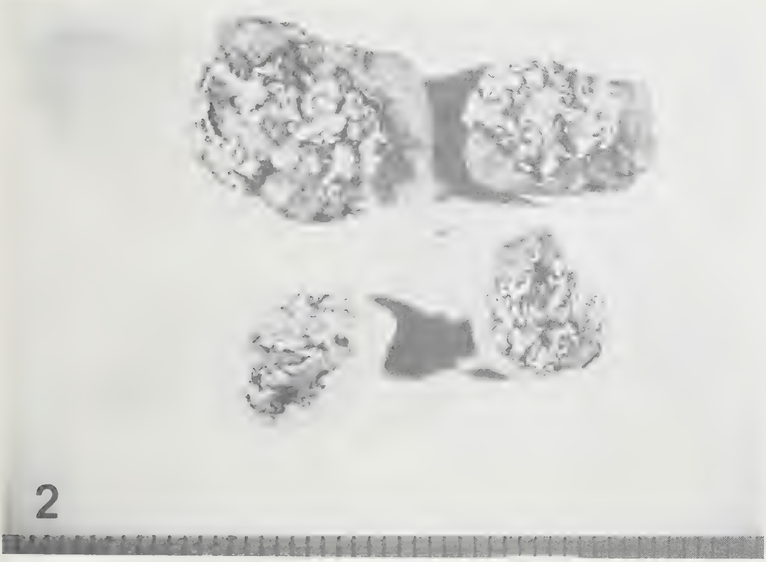

FIG. 2.
Xanthoparmelia cedrus-montana Brusse (holotype). Scale in mm.

Xanthoparmelia cylindriloba Knox, sp. nov. **Fig. 3.**

Thallus terricola, pallide flavovirens vel atrans. Lobi 0,5–1,5 mm lati, plus minusve cylindrici post substitutionem inferiori cortici superiore cortice. Pagina infera nigra, rhizinis nigris caespitosis. Isidiis sorediisque carens. Cortex superior 25–30 μm crassus, stratum gonidiale 40–50 μm crassum, medulla alba 320–520 μm crassa, cortex inferior 20–25 μm crassus. Apothecia pycnidiaque ignota.

Cortex superior K non reagens (acidum usnicum continens), medulla alba K flavescens tum sanguinea, C non reagens, P aurantiaca (acidum salazinicum et acidum norsticticum minutissimum continens).

Typus: KENYA COLONY: Mt. Kenya, Teleki Valley, alpine region, in the uppermost part of the valley, on frost-lifting ground, 4 200 m. 27/7/1948, *Hedberg s.n.*, Flora Africana *1705* (UPS, holotype; US, isotype).

OTHER COLLECTION

TANGANYIKA TERRITORY: Kilimanjaro, above Peters Hut, 3 970 m 23/6/1948, *Hedberg s.n.*, Flora Africana *1354* (UPS).

Xanthoparmelia cylindriloba is a very distinctive species with erect, more or less cylindrical lobes, growing on soil. In both the specimens examined,

these lobes were separate, and it may be that in younger specimens a basal, broad-lobed region also occurs. No evidence of such lobes could, however, be found.

Although many species of *Xanthoparmelia* contain salazinic acid, the distinctive morphology of *X. cylindriloba* clearly separates it from other species in the genus.

Xanthoparmelia dysprosa Brusse et Knox, sp. nov. **Fig. 4.**

Thallus sordide flavescenti-virescens, saxicola, laxe adnatus vel pulvinatus. Lobi lati tum divaricate ramosi lineares 0,5–1,5 mm in latitudinem, valde albomaculati. Isidiis soredisque carens. Pagina infera nigra, nuda vel sparsim rhizinata. Cortex superior 14–17 μm crassus, stratum gonidiale interruptum, 60–65 μm crassum, medulla alba 120–130 μm crassa, cortex inferior 16–18 μm crassus. Apothecia dispersa, usque ad 12 mm diametro, cupulata demum aperientia. Hymenium 50–55 μm crassum, subhymenium 40–45 μm crassum, excipulum 260–310 μm crassum. Sporae non visae.

Cortex superior K non reagens (acidum usnicum continens), medulla alba K non reagens, C non reagens, KC pallide rosea (acidum evernicum continens).

Typus: CAPE—3318 (Cape Town): Platteklip, Vlottenberg (-AD), on granite rock, *S. Garside 5035(a)* (BOL, holotype; US, isotype).

OTHER SPECIMEN SEEN

CAPE—3218 (Clanwilliam): 25 km south of Clanwilliam, Olifants River Valley (-BD), on TMS, alt. 400–600 m, *Brusse 772 8–1–6*.

Xanthoparmelia dysprosa is the seventh species in the *X. hypoleia* complex, which includes *Parmelia (Xanthoparmelia) burmeisteri* Elix, *X. hypoprotocetrarica* (Kurok. et Elix) Hale, *X. notata* (Kurok.) Hale, *P. (Xanthoparmelia) pseudohypoleia* Elix, *X. cedrus-montana*, described above, and *X. karoo* Knox et Brusse and *X. leucostigma* Brusse, described later. Within the group there is considerable uniformity of morphology between species, although some small variations in lobe size do occur.

The chief common characteristic is the effigurate maculate appearance of the upper surface, and differentiation between species is based primarily on the different chemical constituents found in the medulla. In *X. dysprosa* is found the relatively uncommon (in *Xanthoparmelia*) orcinol p-depside, evernic acid, while *P. burmeisteri* contains the ß-orcinol p-depsides barbatic and 4-0-demethyl barbatic acids. Four other species, *X. hypoleia, X. hypoprotocetrarica, X. karoo* and *P. pseudohypoleia* contain related ß-orcinol depsidones, and *X. notata* contains the "mixed" depsidone, notatic acid. A further orcinol p-depside, gyrophoric acid, has been found in *X. leucostigma,* described subsequently.

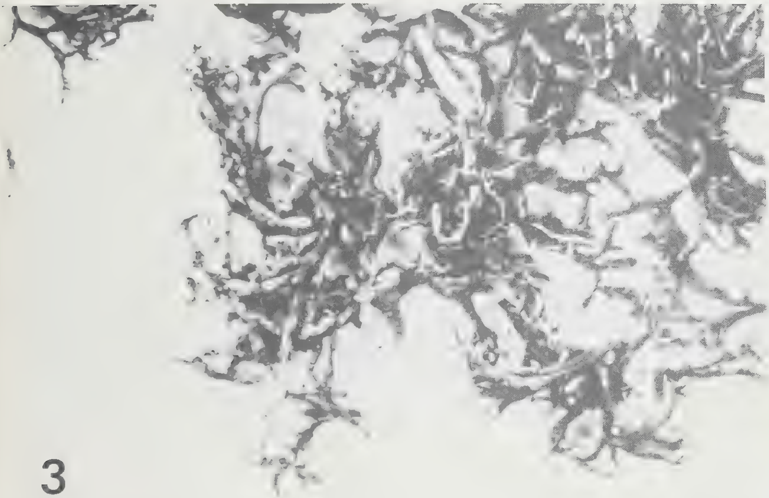

FIG. 3.
Xanthoparmelia cylindriloba Knox (holotype).

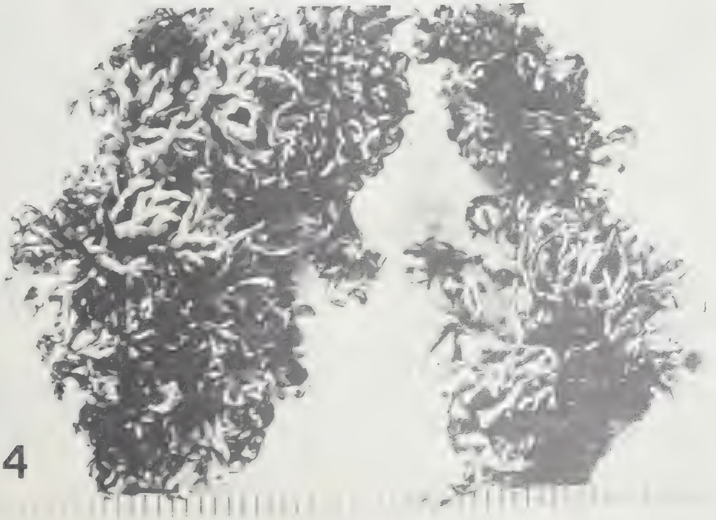

FIG. 4.
Xanthoparmelia dysprosa Brusse et Knox (holotype). Scales in mm.

Xanthoparmelia exornata (Zahlbr.) Brusse et Knox, comb. nov. **Fig. 5.** Basionym: *Parmelia conturbata* var. *exornata* Zahlbruckner (1932) Ann. Crypt. Exot. **5**: 251–252.

Typus: CAPE—Namaqualand: Steinkopf, Leg. Pastor G. Mayer, *P. A. v. d. Bijl 950* (W(1934) 315, holotype!; STEU, isotype).

Thallus foliose, loosely to tightly adnate on rock, up to 100 mm across. Lobes plane to more usually strongly convex, sublinear to elongate, discrete to imbricate, 1–3 mm broad, leathery. Upper surface yellowish green, darkening towards the centre, strongly maculate to almost pseudocyphellate in regions where the epicortex is highly pored. Lower surface pale brown, moderately rhizinate. Upper cortex very uneven, 10–250 μm thick; algal layer discontinuous, up to 100 μm thick; medulla 100–600 μm thick; lower cortex 20–40 μm thick. Apothecia sparse to moderately abundant, substipitate, up to 7 mm in diameter, shallowly cupped. Hymenium 40–60 μm thick, subhymenium 5–15 μm thick, exciple 30–120 μm thick. Ascospores 8, 7,0–11,0 × 5,0–6,5 μm. Pycnidiospores 5–8 μm long.

Upper cortex K^- (usnic acid), medulla K^+ yellow turning red (salazinic acid usually together with the chalybaeizans unknown).

This very distinctive species is widespread in the Karoo, but shows no close relationships with any other Xanthoparmeliae. All the other strongly maculate species are in the *X. hypoleia* complex, and have narrower, more linear lobes, with a black undersurface and sparse rhizines. *X. exornata* represents the extreme state of the effigurate maculate condition found in the *X. hypoleia* complex and in *Omphalodium hottentottum* (Ach.) Flot. In *X. exornata* the epicortical pores are closely aggregated, and may weather to produce discontinuities which resemble pseudocyphellae, but as pointed out by Hale (1981), investigation of the development of these structures will reveal their true nature.

Xanthoparmelia fucina Knox, sp. nov. **Fig. 6.**

Thallus sordide flavescenti-virescens, saxicola adnatus vel laxe adnatus, centrum versus dense isidiatus. Lobi subirregulares, aliquantum dissecti, 0,7–2,0 mm lati. Pagina infera pallide castanea, interdum apices versus atrans. Rhizinae moderate abundantes cum pagina infera concolorae. Isidia plerumque simplicia, 0,1–0,3 × 0,2–0,7 mm. Cortex superior 18–20 μm crassus, stratum gonidiale 30–35 μm crassum, medulla alba 75–90 μm crassa, cortex inferior 10–12 μm crassus. Apothecia non visa.

Cortex superior K non reagens (acidum usnicum continens), medulla K, P aurantiaca (acidum protocetraricum et maculae irregulares rhodophyscinae continens).

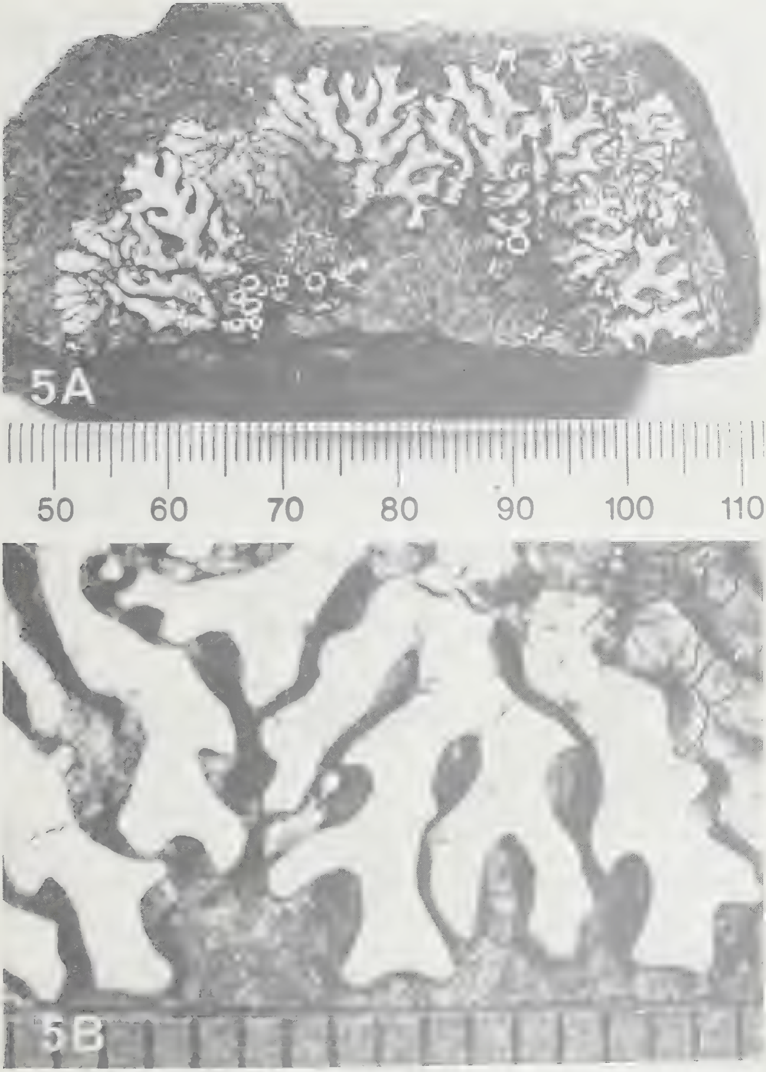

FIG. 5.
Xanthoparmelia exornata (Zahlbr.) Brusse et Knox. A. Typical growth form; B. The maculate upper surface. Scales in mm.

Typus: ZIMBABWE: World's View, Matopos, S Rhodesia, common on vertical to horizontal granite faces, usually east aspect, 9 vii 1946, *E.A. Schelpe 1591* (BOL, holotype; US, isotype).

Xanthoparmelia fucina is similar in form to *X. subramigera* (Gyel.) Hale, but differs in having slightly narrower lobes, and in containing protocetraric acid, rather than fumarprotocetraric and succinprotocetraric acids. Also similar morphologically is *X. weberi* (Hale) Hale, which has narrower lobes, smaller isidia and contains hypoprotocetraric acid. No sexual (apothecial) counterpart for *X. fucina* has been found.

Xanthoparmelia hedbergii Knox, sp. nov. **Fig. 7.**

Thallus sordide flavescenti-virescens, saxicola, arcte adnatus, transverse rimosus vel centrum versus aliquantum areolatus. Lobi sublineares, 0,5–1,0 mm lati, pagina infera pallida vel badia, rhizinis paene apicibus; rhizinae cum pagina infera concolorae. Isidia cylindrica vel parum inflata, 0,05–0,1 × 0,1–0,3 mm abundantia sed non densa. Cortex superior 15–20 μm crassus, stratum gonidiale 30–35 μm crassum, medulla alba 100–130 μm crassa, cortex inferior 10–12 μm crassus. Apothecia non visa.

Cortex superior K non reagens (acidum usnicum continens), medulla alba K non reagens, C non reagens vel pallide rosea, KC pallide rosea, P non reagens (acidum hypoprotocetraricum continens).

Typus: KENYA: Rift Valley, S of Lake Naivasha, Olkaria area, near stream exit on recent lava flow, c2000 m, 5 iv 1976, *0. Hedberg s.n.,* Flora of Kenya *6204d* (UPS, holotype; US, isotype).

Xanthoparmelia hedbergii is morphologically close to *X. neocongensis* (Hale) Hale and to *X. weberi*, and all three species contain hypoprotocetraric acid. Lobe size in *X. neocongensis* and *X. hedbergii* are in the same range, but the former species is distinguished by having a black lower surface. Lobes in *X. weberi* are broader than those in *X. hedbergii*. Although lobe size is influenced by environment, no tendency to a reduced lobe width could be found in South African populations of *X. weberi*, even in adverse conditions. On this basis, *X. hedbergii* is recognised as distinct from *X. weberi*, and is assumed to have a more northerly distribution.

Xanthoparmelia ianthina Brusse, sp. nov. **Fig. 8.**

Thallus foliosus, flavovirens vel olivaceus, saxicola moderate adnatus, usque ad 60 mm in diametro. Lobi sublineares, 0,5–2,0 mm lati; cortice superiore fatiscenti medulla ianthina revelata. Isidiis sorediisque carens. Pagina infera pallide spadicea, rhizinis sparsis vel moderate abundantibus. Cortex superior 12–20 μm crassus, stratum gonidiale 20–50 μm crassum, medulla 20–140 μm crassa, cortex inferior 5–15 μm crassus. Apothecia rara,

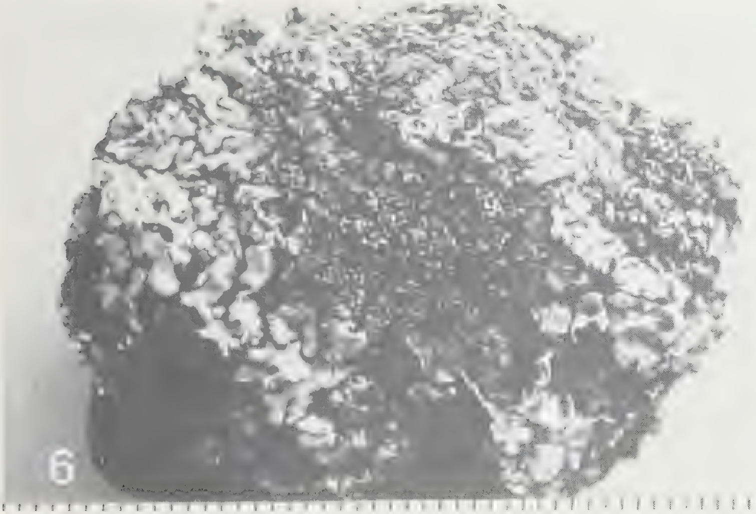

FIG. 6.
Xanthoparmelia fucina Knox (holotype).

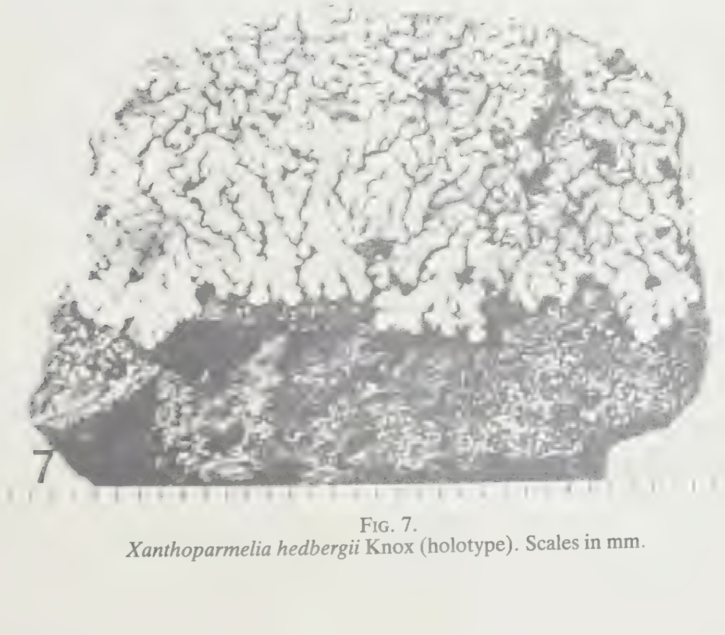

FIG. 7.
Xanthoparmelia hedbergii Knox (holotype). Scales in mm.

substipitata, usque ad 2,5 mm in diametro cupulis vadosis. Hymenium 40–60 μm crassum, subhymenium 20 μm crassum, excipulum 20–30 μm crassum. Sporae 8, 7,0–11,0 × 4,0–6,5 μm; pycnidiosporae 5,0–7,0 μm longae.

Cortex superior K non reagens (usnic acid continens), medulla ianthina, K intense purpurea (pigmenta anthraquinonica et materia ignota continens).

Typus: CAPE—3119 (Calvinia): 42 km NE of Vanrhynsdorp, Vanrhyn's Pass (-AC), on TMS, alt 460–610 m, *Brusse 768–10–1–15.*

This species closely resembles *X. endomiltodes* (Nyl) Hale, but differs in lacking salazinic acid and in containing two unknown substances, designated Th–1 and Th–2. These two substances are suspected β–orcinol m–depsides, exhibiting the following characteristics. Th–1 is K^+ yellow, rapidly becoming bright orange-red. On thin-layer chromatography (TLC) plates developed in 10 % sulphuric acid it is olive to brown, whereas Th–2 is olive to greyish. Th–1 is yellow-brown to brown in long-wave (366 nm) uv light, and Th–2 is brown. Table 1 gives TLC data for these two substances in comparison with the standards atranorin and norstictic acid, expressed in the format employed by Culberson (1972).

Microhydrolysis of Th–1 according to the method described by Culberson (1972), and using for comparison baeomycesic acid obtained from *Siphula torulosa* (Thunb. ex Ach.) Nyl. indicated that the A-ring in both cases was (after oxidation by sulphuric acid during the hydrolysis procedure) 4–0–methyl–3–carboxyorsellinic acid. No second subunit could be detected from this procedure, and it was assumed to have remained at the origin.

Xanthoparmelia karoo Knox et Brusse, sp. nov. **Fig. 9.**

Thallus foliosus, saxicola, moderate vel arcte adnatus, usque ad 60 mm in diametro. Lobi 0,8–1,5 mm lati, convexi, lineares vel sublineares, unifor-

TABLE 1.
TLC data for the two suspected m–depsides Th–1 and Th–2, using norstictic acid and atranorin as standards.

Lichen substance	R_f class Solvents			$R_f \times 100^a$ Solvents		
	A	B	C	A	B	C
Th–1	4	1–2	3	40/40,75 (56)	6/39,73 (56)	18/34,77 (55)
Th–2	3	1	1–2	21/35,72 (54)	0/35,65 (49)	6/32,77 (54)

[a] The $R_f \times 100$ value is given, followed by a virgule, and then the $R_f \times 100$ values for norstictic acid and atranorin, with the mean of these two in parentheses.

miter appressi, dilute vel manifeste albomaculati. Pagina infera nigra, grosse rhizinata. Isidiis sorediisque carens. Cortex superior 20–100 μm crassus, stratum gonidiale 40–80 μm crassum, medulla alba 50–500 μm crassa, cortex inferior 30–60 μm crassus. Apothecia sparsa vel moderate abunda, substipitata, usque ad 5 mm diametro, cupulis vadosis. Hymenium 40–60 μm crassum, subhymenium 5–10 μm crassum, excipulum 30–60 μm crassum. Ascosporae 8, 8,0–13,0 × 4,0–6,0 μm. Pycnidia 100–200 μm diametro, pycnidiosporae 5,0–8,0 μm longae.

Cortex superior K non reagens (acidum usnicum continens), medulla K non reagens, C pallide rosea, KC rosea (acidum hypoprotocetraricum continens, aliquando acido 4–0–methylhypoprotocetrarico).

Typus: CAPE—3219 (Wuppertal): 32 km NE of Clanwilliam, Klipfonteinrand (-AA), on TMS, alt. 300–450 m, *Brusse 768–10–3–7* (J, holotype).

Morphologically, *X. karoo* resembles *X. exornata,* but is less distinctly maculate. The medullary chemistry is identical to that of *X. hypoprotocetrarica,* but the latter species is less adnate, has broader lobes and usually exhibits a denser, more imbricate or even pulvinate growth form. In lobe form, *X. karoo* may be considered as part of the *X. hypoleia* complex, but is distinguished from the other members of this group by its closely adnate mode of growth.

Xanthoparmelia leucostigma Brusse, sp. nov. **Fig. 10.**

Thallus sordide flavovirescens, saxicola, moderate vel arcte adnatus. Lobi lineares, plani vel convexi, uniformiter appressi, contigui, 0,5–3,0 mm lati, albomaculati. Pagina infera eborina vel pallide fusca, moderate rhizinata, rhizinis grossis. Isidiis sorediisque carens. Cortex superior 15–70 μm crassus, stratum gonidiale irregulare, 40–80 μm crassum, medulla 60–200 μm crassa, cortex inferior 15–30 μm crassus. Apothecia sparsa vel moderate numerosa, substipitate, usque ad 3 mm diametro. Hymenium 40–60 μm crassum, subhymenium 10–15 μm crassum, excipulum 20–40 μm crassum. Ascosporae 8, 6,0–9,5 × 4,5–5,5 μm. Pycnidia globosa, 100–200 μm diametro, pycnidiosporae 5–8 μm longae.

Cortex superior K non reagens (acidum usnicum continens), medulla alba K non reagens, C dilute rosea (acidum gyrophoricum continens).

Typus: CAPE—3322 (Oudtshoorn): 18 km N of De Rust, Meiringspoort (-BC), *F. Brusse 772 14–1–17* (PRE, holotype).

This species is at present known only from the type collection, but is important in that it is a further member of the *X. hypoleia* group containing another orcinol p-depside, gyrophoric acid. Chemical relationships within this group will be discussed in a subsequent publication.

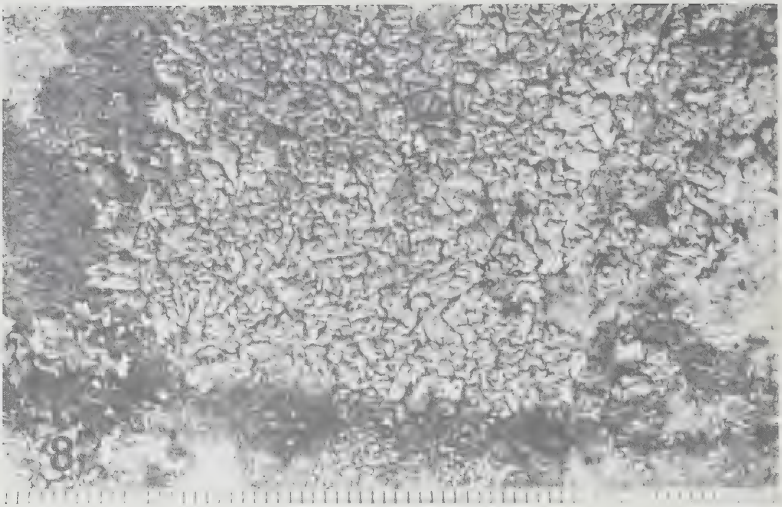

FIG. 8.
Xanthoparmelia ianthina Brusse (holotype).

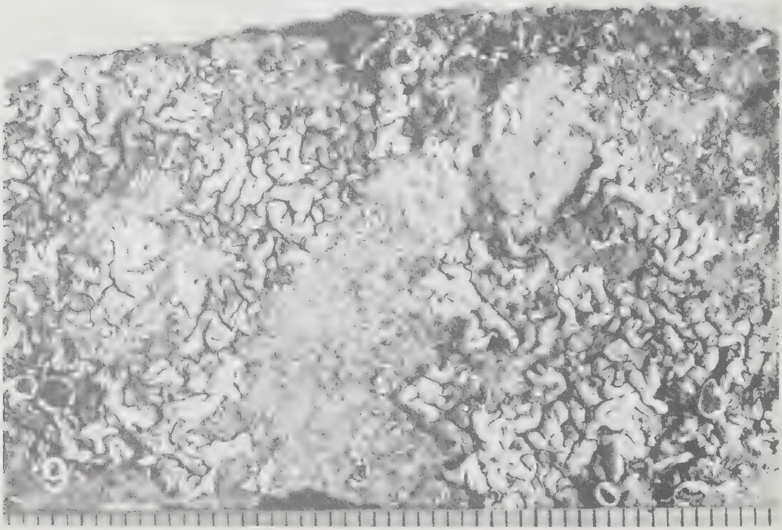

FIG. 9.
Xanthoparmelia karoo Knox et Brusse (holotype). Scales in mm.

Xanthoparmelia walteri Knox, sp. nov. **Fig. 11.**

Thallus foliosus, flavovirens, prostratus vel subascendens, usque ad 30 mm diametro, saxa parva habitans. Lobi ligulati, maculatuli, 0,5–1,5 mm lati, paginis inferibus nigris, rugosis, nudis vel sparse rhizinatis. Isidiis sorediisque carens. Cortex superior 18–20 μm crassus, stratum gonidiale 30–35 μm crassum, medulla 90–110 μm crassa, cortex inferior 12–15 μm crassus. Apothecia non visa.

Cortex superior K non reagens (acidum usnicum continens), medulla alba K flavescens tum sanguinea (acidum salazinicum et acidum norsticticum minutissimum continens).

Typus: S.W.A./NAMIBIA—2214 (Swakopmund): Namibwüste 10 bis 20 km nördlich von Swakopmund (-DA), Kieswüste auf dunklen Doleritsteinchen, Mitte Oktober 1977 + December 1977, *L. Moisel für H. and E. Walter No. 5168.*

Salazinic acid is certainly the most common medullary constituent in *Xanthoparmelia*, there being more than 50 valid species containing this substance. *Xanthoparmelia walteri*, lacking isidia and soredia, is clearly related to *X. constrictans* (Nyl.) Hale, but differs in its semi-erect growth form and in its more regular, straplike lobes.

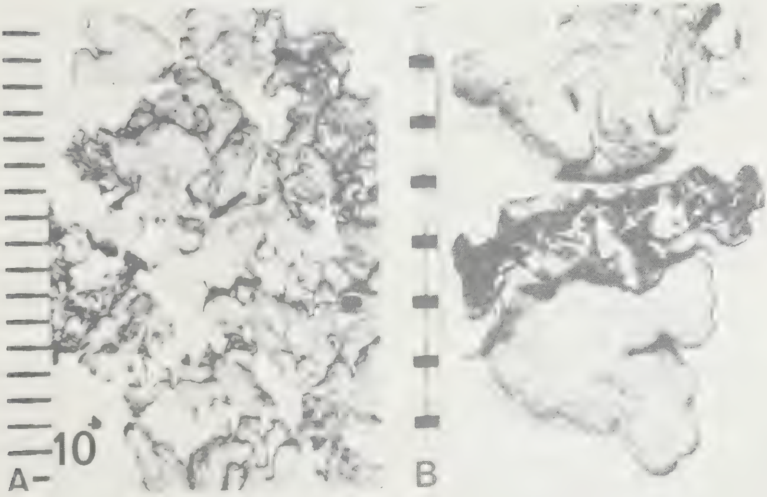

FIG. 10.
Xanthoparmelia leucostigma Brusse (holotype). Scales in mm.

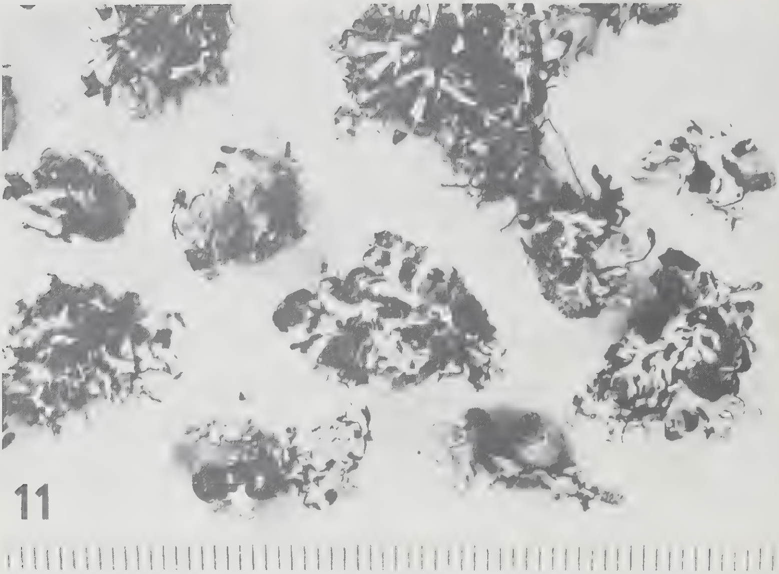

Fig. 11.
Xanthoparmelia walteri Knox (holotype). Scale in mm.

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